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 Our Ref:
 P7434\GAL

Date: 31st January 2017

HT Forrest Ltd The Yard Westhoughton Bolton BL5 3NU

Attention of Mr I Calder

BY EMAIL ONLY

Dear lan,

Re: Gas Addendum Letter for Marsh Lane, New Mills

The gas monitoring programme at the above site is now complete. The assessment below supersedes the information in the Site Appraisal Reports undertaken by GRM's (ref: GRM/P7434/F.1 Rev.A, dated November 2016) and CL Associates (red: 42062/1, dated September 2004) and should be submitted to the regulatory bodies for approval.

The Phase II Site Appraisal identified the following potential sources of ground gas:

- Deep made ground landfill type material and reworked natural material.
- The site is not in an area where radon protective measures are required.

GRM Ground Investigation Summary

The recent GRM ground investigation identified made ground extending to depths of up to 7.0m begl. Made ground with a greater quantity of anthropogenic material was encountered predominantly towards the northwest and is considered to be associated with the former unlicensed landfill. This made ground generally comprised loose brown or grey locally black clayey sand with abundant gravel of sandstone, siltstone, plastic, metal, glass, brick, ceramic, cloth and rubber with asbestos, ash, coal and clinker.

Across the remainder of the site to the east and south the made ground was considered to be reworked natural materials associated with the backfilling of the former quarry. This made ground was recorded as loose to medium dense clayey, fine to coarse sand with abundant gravel and cobbles of sandstone.

Made ground was not found at depths greater than 1m within the northwestern corner of the site and is underlain by superficial Glacial Till.

The solid geology was confirmed as sandstone from the Woodhead Hill Rock Formation.



CL Associates Gas Results

Prior to the recent works CL Associates installed two gas monitoring standpipes within the made ground materials (BH1 and BH2) drilled at the northern end of the site. CL Associates carried out a total of three gas monitoring visits between 15th and 31st January 2003.

ESG monitored the boreholes installed from CL Associates during 2011, however BH2 could not be located at the time and the full report was not available to GRM. Therefore, the ESG data has not been included within the assessment.

Well ID (No.	Response	Methane	Carbon	Oxygen	Gas	Ground-Water	
of Readings)	Zone / Strata	(%v/v)	Dioxide	(%v/v)	Flow	Level (mbeal)	
		(%)()		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Max		
			(/01/1)		(l/b)		
					(1/11)		
		0					
BH1 (3)	1.0-5.0m / MG	0.0	0.1-1.0	17.9-19.7	3.0	5.20-5.23	
BH2 (3)	1.0-7.5m / MG	0.0	0.1-0.4	18.8-20.5	3.2	5.48-5.49	
Notes: NS= Nat	ural Strata, MG= Ma	de Ground	Atmosph	eric Pressu	re: 961mb – 1002mb		
BH1 (3) BH2 (3) Notes: NS= Nat	1.0-5.0m / MG 1.0-7.5m / MG ural Strata, MG= Ma	C 0.0 0.0 de Ground	CL Associates 0.1-1.0 0.1-0.4	17.9-19.7 18.8-20.5 Atmosph	(I/h) 3.0 3.2 eric Pressu	5.20-5.23 5.48-5.49 re: 961mb – 1002rr	

The CL Associates gas results are summarised below;

Copies of the borehole logs and gas results are enclosed.

GRM Gas Results

Since the CL Associates results GRM has installed a further 6 monitoring wells and carried out fortnightly gas monitoring over a three month period from 25th October 2016 to 6th January 2017, to assess the risk posed to the end user from potentially harmful ground gases.

As the proposed end use has been classified as high sensitivity (residential with gardens), six 35mm gas/water monitoring standpipes have been installed by GRM across the site. WS107 and WS108 targeted made ground associated with the former landfill site (high generation potential) and WS104-WS106 targeted made ground associated with the former quarry. WS101 targeted the Glacial Till, where no made ground was present and to determine the potential for the migration of ground gases off site.

WS101 was not found during the first monitoring round and WS106 was destroyed prior to the fourth monitoring round.

The GRM gas results have been summarised below;

Well ID (No. of Readings)	Response Zone / Strata	Methane (%v/v)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Gas Flow Max (l/h)	Ground-Water Level (mbegl)
		(GRM Results			
WS101 (5)	1-5m / NS	0.0	0.0-2.0	17.4-20.2	0.0	4.03-4.63
WS104 (6)	0.7-4m / MG	0.0	0.4-2.7	16.0-20.5	0.1	DRY
WS105 (6)	0.6-5m / MG	0.0	0.1-1.5	17.9-20.8	0.0	DRY
WS106 (4)	0.5-2.5m / MG	0.0	0.0-0.1	20.2-21.0	0.0	5.13
WS107 (6)	1-5.3m / MG	0.0	0.0-1.0	19.1-20.8	0.0	5-5.2
WS108 (6)	1-5m / MG	0.0	0.5-1.2	19.0-20.3	0.0	DRY
Notes: NS= Nat	tural Strata, MG= Ma	de Ground	Atmosph	eric Pressu	re: 987mb-1032mb	



Copies of the GRM window sample logs and gas results are enclosed.

Groundwater Monitoring Results

Three groundwater monitoring wells were installed by GRM within rotary boreholes drilled into the Woodhead Hill Rock (RB101, RB104 and RB106) to determine the presence of groundwater within the sandstone.

The recent GRM groundwater monitoring program has confirmed the general presence of deep groundwater beneath the site at depths in between 4.03m and 7.85m begl. In summary:

- Groundwater within the Made ground was encountered between 5.00m and 5.20m begl.
- Groundwater within the Glacial Till in WS101 was encountered between 4.03m and 5.13m begl.
- Groundwater within the Woodhead Hill Rock was encountered between 5.30m and 7.85m begl.
- WS104-WS106 and WS108 did not record any groundwater during the monitoring period.

It should be noted that groundwater was consistently present within the deep boreholes during each monitoring round.

Ground Gas Risk Assessment

Given the 'high' sensitivity of the proposed development (residential with gardens) and 'high' ground gas generation potential (refuse tip mid-1960s to 1980s) a monitoring programme of up to 12 months may be required under BS8576:2013.

Taking into account that a significant proportion of degradable materials were not encountered within the made ground, it is considered that there could be confined areas of more degradable materials present that were not identified during the recent works.

Nine gas monitoring visits have been completed at the site, effectively over a 4 month period.

Made Ground

The gas results from CL Associates and GRM have been assessed in accordance with current guidance BS8485:2015 Code of practice for the design of protective measures from methane and carbon dioxide ground gases for new buildings.

CL Associates recorded a maximum flow rate of 3.2l/hr, and GRM recorded a maximum steady state carbon dioxide concentration of 2.7% v/v. No methane was detected above the monitor's lower limits of detection from either monitoring period. Therefore, in the following assessment a default methane concentration of 0.1% v/v have been used.

Using the maximum default methane concentration of 0.1% v/v and the maximum flow rate of 3.2l/hr a Qhg of 0.0032 l/hr has been calculated for methane. Using the maximum recorded steady state carbon dioxide concentration of 2.7% v/v and the maximum flow rate of 3.2 l/hr a Qhg of 0.0864 l/hr has been calculated for carbon dioxide. On this basis, the GSV for the site is determined as 0.0864 l/hr for the made ground.

As the GSV is greater than 0.07l/hr, but less than 0.7l/hr, the site has been assessed as 'Characteristic Situation 2' (low hazard potential) as outlined in Table 2 of BS8485:2015. Therefore, gas protection measures are required for the proposed development where deep made ground is present.

It should be noted that the GSV when compared against guidance in CIRIA C665 is less than 0.16 l/hr for methane and 0.78 l/hr for carbon dioxide which would result in a 'Green' traffic light classification for the site and therefore gas protection measures would not be required.



Natural Strata (Glacial Till)

Within the northwest corner, made ground was not encountered, therefore, the following assessment has been carried out to determine the potential migration of ground gases from the adjacent deep made ground.

Methane concentrations and flow rates above the monitor's lower limits of detection were not detected during monitoring period. Therefore, in the following assessment a default methane concentration of 0.1% v/v and a default flow rate of 0.11/hr have been used for Glacial Till.

Using the default methane concentration of 0.1%/v and the default flow rate of 0.1/hr a Qhg of 0.0001 l/hr has been calculated for methane. Using the maximum recorded steady state carbon dioxide concentration of 2%/v and the default flow rate of 0.1/hr a Qhg of 0.002 l/hr has been calculated for carbon dioxide. On this basis the GSV for the site is determined as 0.002 l/hr.

As the GSV is less than 0.07l/hr and the maximum recorded concentrations of methane and carbon dioxide are less than 1%v/v and 5%v/v respectively, this area of the site has been assessed as 'Characteristic Situation 1' (very low hazard potential) as outlined in Table 2 of BS8485:2015, for which gas protection measures are not required for these plots.

A delineation plan of protection measures is enclosed.

It is recommended that ventilated suspended floor slabs (i.e. beam and block) are used within these proposed plots which will provide a sufficient level of protection given the proximity to the identified gas source and the potential for future migration of ground gases.

Conclusions

The gas monitoring results and subsequent gas risk assessment has demonstrated that the site is borderline with regard to the risk posed. Using the most recent guidance (BS8485:2015), the risk is considered to be Low, but gas protection measures would be required. However, CIRIA C665 guidance, which relates specifically to low rise housing, such as that proposed, indicates that gas protection measures are not required.

Overall, it is considered that the perceived risk is greater than the actual risks; however, given the borderline nature of the assessment, it is recommended that without further monitoring and assessment to improve the dataset, a conservative approach should be taken and that gas protection measures should be adopted.

Whilst further monitoring could be undertaken, it is considered that the amount of additional information needed would be such that it would cause either significant delays to the programme, or the additional costs would outweigh the savings of not installing gas protection measures.

Once this assessment has been agreed with the appropriate regulators, a Gas Protection Measures Design and Verification Plan will be required (in line with CIRIA C735); however, at this stage, allowance should be made for the use of beam and block floors and a proprietary gas resistant membrane (which meets the requirements of BS8584:2015 such as Monarflex Reflex Super) installed to an appropriate standard by a qualified contractor with independent validation and integrity testing.

As gas protective measures are required, it is recommended that a Gas Protection Measures Design and Verification Plan is produced and agreed with the Local Authority.

If you would like us to undertake this on your behalf, then please provide contact details and a Planning Reference.



We trust this is suitable for you current requirements, should you require any further information or would like any clarification of the points raised please do not hesitate to contact us.

Yours sincerely, for GRM Development Solutions Ltd

Sonia Singh BSc (Hons) FGS Assisting Geo-environmental Engineer

Charlotte Taylor BSc (Hons) MIEnvSc (Senior Environmental Scientist)

Richard Upton BSc (Hons) MSc CEnv (Director)

Enc: P7434 Gas Monitoring Location Plan P7434 CL Associates Borehole Logs and Gas Monitoring Results P7434 GRM Exploratory Hole Logs and Gas Monitoring Results P7434 Gas Protection Measures Plan





GRM Investigation

NOTES:

- Window Sample Hole
- ★ Rotary Borehole
- CL Associates Investigation
- Cable Percussive Borehole

HT Forrest Ltd	TITLE:	PROJECT No: DATE: DATE: 11/2016		GRM		
PROJECT:	Monitoring Hole Location Plan	DESIGN/DRAWN: SS	ISSUE: FINAL	GRM Development Solutions Ltd		
Land off Marsh Lane, New Mills		© GRM Developm © Crown Copyrig	nent Solutions Ltd ht. AL 100014100	Burton-on-Trent, Staffordshire Tel: 01283 551 249 Fax: 01283 211 968 mail@grm-uk.com www.grm-uk.com		

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Borehole Log

Drilled by A Logged by A Checked by C	AJL Start 02/01/2003 AJL End CAR 02/01/2003	Equipment, Metho Dando 150 Cable Pe In tree clearing oppo	ods and Remarks ercussion Rig site steel container		Depth from to Diameter Casir 0 C	ng Depth Ground Lev NDm Coordinate: National Gr	el - s - id -
Sample	s and Tests	;		Strata			
Depth	Type & No	Records	Date Time Casing Wate		Description	Depth,Leve (Thickness	/ Legend Backfill/
0.30 0.50-1.00	D 1 B 2			Grass overlying TOPSC MADE GROUND. Soft t CLAY Gravels are suba subrounded, fine to coas brick, stone, wood, meta occasionally rubber.	IL rown sandy gravelly ingular to se of ash, il and	0.10	
1 30 1 50-1 95 1 50-2 00	D 3 SPT C B 4	N=4 (1 1/1.1 1.1)	1 50	MADE GROUND. Soft of gravelly CLAY Gravels a angular, fine to coarse o mudstone, brick, various lithologies and occasion	orange brown sandy are angular to sub f sandstone, other al wood	1 20	
2 50	D 5						
3 00-3 45 3 00-3 50	SPT C B 6	N=5 (1, 1/1.1,2.1)	2 50			- (4 70)	
4 00	7 כן						
4 50-4.85 4 50-5.00	SPT C B 8	51 (1.1/1.7.43 for 50mn	ר) 3.20				
5 40 5 50	W 10 D 9						
6 00-6.03 6 00	SPT C D 11	(75 for 25mm)	3:20 5;4	Fine brown SANDSTONI gravels and cobbles. EXPLORATORY HOLE	E recovered as ENDS AT 6 00 m	6.00	,
							4
Depth	Type & No	Records	Date Time Casing Water	-			
Groundwater No. Struck (m) 1 590	Post strike behav Rose to 5 40 m a	tiour fter 20 minutes	Depth sealed (m) -	Depth Related Remarks From to (m)		Chiselling Depths (m) 4.80 -5 10	45 mins Chisel
Notes: For explan abbreviations see levels in metres in depth column Scale 1 50	nation of symbols and a key sheet All depth Stratum thickness giv (c) MESG HBIII (275)	s and reduced en in brackets 07/02/2003 12:41:55	Project Project No. Carried out for	I New Mills, Derbyshire 42062		Borehole St	BH1 neet 1 of 1

Borehole Log

Dril Log Che	led by A gged by A ecked by (AJL Start 03/01/2003 AJL End CAR 03/01/2003	Equipment, Methe Dando 150 Cable Pe Infront of main wood	ods and Rem ercussion Rig led area oppos	iarks ite steel co	ontainer	Depth from to I	Diameter Casing Depth	Ground Level Coordinates National Grid	1	- - +
s	ample	s and Tests	}			Strata	-				
···	Depth	Type & No	Records	Date Casing	Time Water		Description		Depth,Level (Thickness)	Legend	Backfill/
	0 50-1 00	В 1				Grass overlying TOPSO MADE GROUND: Soft to orange brown to brown s cobbly CLAY Gravels ar subangular to subrounde of ash, brick, sandstone, occasional wood and gla	L o firm slightly andy gravelly d cobbles are d fine to coarse concrete and ss		0.10		
	1 30	D 2								$\langle X \rangle$	$ \frac{1}{2} $
	1.50-1 88 1 50-2 00	SPT C B 3	N=4 (1/1.1.1 1)	1 50							
-	2 50	D 4								\bigotimes	
	3 00-3 45 3 00-3 50	SPT C B 5	N=8 (1,1/2.1.2.3)	1 50				3 00-3 50 m Becoming firm		\bigotimes	
• • •	4 00	D 6						אי שי שי שי שי	(7.50)		0000
5	4 50-4 95 4 50-5:00	SPT C B 7	N=13 (1.2/1,2,4,6)	4 50				4,50-6 50 m Medium dense silly cobbly sands and gravels of sandstone and occasional brick			
	5 50 5 50	D 8 W 9									
	6 00-6 45 6 00-6 50	SPT C B 10	N=12 (2.1/2.3.5.2)	6 00	5 50			- - - - - - - - - - - - - - - - - - -			
-	7 00	D 11						-			
	7 50-7 95 7 50-8 00	SPT C B 12	N=14 (1.1/2.2.4.6)	7 50	5 50	Fine grey SANDSTONE r and cobbles	ecovered as gravels		7.60 (0.40) 8.00		SP
	Death	Tuga & No	Records	Date	Time	EXPLORATORY HOLE I	NDS AT 8 00 m	- - - - - - - - - - - - - - - - - - -			
Gro	undwater	TYPE BLIND	NUCCIUS	Casing	vvater	Depth Related Remarks			Chisellina	t)	
No.	Struck (m) 5 70	Post strike behavi Rose to 5 50 m af	iour ter 20 minutes	Depth s	ealed (m) -	From to (m)			Depths (m)		
Notes abbre	For explan viations see	nation of symbols and key sheet. All depths	and reduced	Project	I	New Mills, Derbyshire			Borehole		
levels in dep Scale	in metres (th column 1:50	C) MESC HBIII (275)	en in brackets 07/02/2003 12:42:05	Project N Carried o	o. 4 ut for	42062			E She	BH2 et 1 of 1	

Site :	New Mills, North Derbyshire								
Location No:	42062	Carried out by:	RL/CA						
Date:	15/01/03	Day: Wednesday							
Weather:	Cloudy, cool								
Pressure Trend: (If Known)	Low								



Sheet of

Pressure i	rena:	Low												LMS	GF60
(If Known)													Senal Number	1147	3244
													Last Service Date	26/07/02	01/08/02
r			Lar	ndfill Mor	nitoring S	ystem (L	MS)		Flow	motor (C	E CON				
Borehole	Time	SWL	CH₄	CO ₂	0,	H ₂ S	Pressure	Inflow /	1100	meter (C			Last Gas Check Date		
Number	(24 Hr)	(mbal)	(%v/v)	(%)///	(0/ 1/14)	10/	1 1035010		Average	Max	Min	Differential	Co	mments	
1	13:30	5.20	0.0	0.1	10.7	(%///)		Outflow	(l/hr)	(l/hr)	<u>(l/hr)</u>	Pressure (mb)			
			0.0	0.1	15.7	0.0	995	NA	0	2.8	-2.2	0	Base: 5.57		
2	13:45	5.49	0.0	0.1	20.5	0.0	006	NIA							
l [20.0	0.0	390	INA	0.6	3.2	-1.3	1	Base: 7.54		
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Notes:	L	LMS detects	CH, and C	O unin-	infra	Jakas' '									
				o ₂ using	unra-red o	perector, F	12S and O	with eler	ctrochemic	al senso	rs.				

2. I/h : Litres per hour, Average flow is over 180 seconds.

%v/v: Volume of gas expressed as a percentage volume in air.
 SWL: Standing water level (depth below ground level - unless stated otherwise)

Site :	New Mills, North Derbyshire									
Location No:	42062	Carried out by:	CAR							
Date:	20/01/03	Day: Monday								
Weather:	Grey and raining									
Pressure Trend:	Low									
(If Known)										



Sheet of

Pressure -	Trend:	Low	_							1				LMS	GF60
(If Known))	1											Serial Number	1147	3244
										1			Last Soprise Date		
													Last Service Date	26/07/02	01/08/02
Borebola	Time	C)A//	La	ndfill Mor	nitoring S	ystem (L	.MS)		Flow	/meter (C	GF 60)		Last Gas Check Date		
Number	(04.14)	SVVL	CH4	CO2	O ₂	H₂S	Pressure	Inflow /	Average	Max	Min	Differential			
1 1	(24 Hr)	(mbgl)	<u>(%v/v)</u>	<u>(%v/v)</u>	<u>(%v/v)</u>	(%v/v)	(mb)	Outflow	(l/hr)	(l/hr)	(l/hr)	Pressure (mb)		ommento	
		5.25	0.0	1.0	18.0	0.0	963	NA	0.7	3.0	-1.4	2			
2	· · · · · · · · · · · · · · · · · · ·	5.48	0.0	0.4	18.8	0.0	961	NΔ	11	20	1.0				
								11/2	1.1	2.9	-1.8	1			
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Notes:		1 I MS detects	CH and (informer 1	1.1		······							

detects CH₄ and CO₂ using infra-red detector, H₂S and O₂ with electrochemical sensors.

2. I/h : Litres per hour. Average flow is over 180 seconds.

3. %v/v: Volume of gas expressed as a percentage volume in air.

4. SWL: Standing water level (depth below ground level - unless stated otherwise)

Notes:

Site :	New Mills, North Derbyshire		
Location No:	42062	Carried out by:	RL
Date:	31/01/03	Day: Friday	
Weather:	Cloudy, sunny spells, cold		
Pressure Trend: (If Known)	High, falling		



		,, ,	.y opens, (2010												Sheet of
Pressure	Trend:		High, fa	lina					······	-					LMS	GF60
(If Known)		3 ,										Serial Number		1175	3244
]				·		
													Last Service Date		21/01/03	01/08/02
	r		La	ndfill Moi	nitoring S	System (L	MS)		Flow	meter (C	3F 60)		Lost Cos Chash D			
Borehole	Time	SWL	CH₄	CO2	0 ₂	H ₂ S	Pressure	Inflow /	Average	Max	Min	Differential		ate		
Number	(24 Hr)	(mbgl)	(%v/v)	(%v/v)	(%v/v)	(%v/v)	(mb)	Outflow	(i/br)	(l/br)	(l/br)	Dinerential Deserves (mb)		Comr	nents	
BH1	14:30	5.20	0.0	0.8	17.9	0.0	1002	NA	-0.2	0.1	-0.6	Pressure (mo)				······
DUD	44.45					L				0.1	-0.0	U				
BHZ	14:45	5.48	0.0	0.2	20.0	0.0	1001	NA	0.0	0.5	-0.5	0			· · · · · · · · · · · · · · · · · · ·	
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Comments	:		L		l		[l								
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Notes:		. LMS detects	CH ₄ and C	CO ₂ Using	infra-red	detector 1	L C and C	with als	-							

ts CH_4 and CO_2 using infra-red detector, H_2S and O_2 with electrochemical sensors.

2. I/h : Litres per hour. Average flow is over 180 seconds.

3. %v/v: Volume of gas expressed as a percentage volume in air.

4. SWL: Standing water level (depth below ground level - unless stated otherwise)



Borehole No

WS101 Sheet 2 of 2

Ground Level (mAOD)

Sit	te Na	me:	Quar	ry Road, Nev	v Mills					(mAO) 180.2	D) 3
	Clien	t:	Forre	est		G	RM Pro	oject Ref	: P7434	Coordin 400647	ates E
ion/	E e		Sample	es/Tests		Dopth	Loval			303307	N
nstallat Backf	Wate Strik	Depth	Туре	Result	Dynamic Probing (Blows per 100mm)	(m)	(m)	Legend	Stratum Description		
		4.20 - 4.30 4.90 - 5.00 5.00	D	N=50 (7,10/50 for 275mm)	(Blows per 100mm)	4.20	176.03		Very stiff, (High strength), brow slightly gravelly, CLAY with low content. Gravel and cobble are coarse, sandstone, mudstone, siltstone. GLACIAL DEPOSITS End of Borehole at 5.00m	n, cobble fine to	
Crew:	Dyna	amic Sa	mpling	Ltd.	Logger: SS	;		Wea	ather: Dry		
Eq	uipme	ent:	Windo	w Sampling R	ig						
R	easor	n for te	rminati	on of borehol	e: Refusal on	stiff clay	/.				
Groun	dwate	r Rema	arks:								
Damp a	and th	en beco	oming w	vet from 3.6m.							
Genera	al Ren	narks:									
Hole Started:17/10/2016Hole Complete:Version:FINALScale:											



Borehole No

WS102 Sheet 1 of 1

Ground Level

(mAOD) 182.18

Site Name:	Quarry Road, New Mills

	Clien	t:	Forre	est		6	RM Pro	oject Re	f : P7434	Coordina	ates ⊏
			Somple	oc/Tooto				-		385361	_ <u>N</u>
Istallatio Backfill	Water Strike	Depth	Type	Result	Dynamic Probing	Depth (m)	Level (m)	Legend	Stratum Description		
		0.20 - 0.30	D			0.20	181.98		Grass over dark brown, clayey Sand is fine to coarse. TOPSOIL Loose, dark brown, very sandy GRAVEL Sand is fine to coars	SAND.	
		0.50 - 0.60	D			0.40	181.78		Gravel is fine to medium, sub-a quartzite and sandstone. GLACIAL DEPOSITS Strong SANDSTONE recovere to coarse, angular to sub-angu	d as fine	
		0.90 - 1.00	D			0.80	181.38	· · · · · · · · · · · · · · · · · · ·	Gravel and Cobbles. WOODHEAD HILL ROCK End of Borehole at 0.80m	/	
Crew: Dynamic Sampling Ltd Logger: SS								We	eather:		
Eq	uipm	ent:	Windo	w Sampling R	ig						
R Groun No gro	easoi dwate undwa	n for te er Rema ater obs	rminati arks: served.	on of borehol	e: Refusal on	Rock					
Genera	al Rer	narks:									
Hole	Starte	ed:	17/10/	/2016 Hc	le Complete:			Versio	on: FINAL Sca	ı le: 1:25	



Site Name:

Quarry Road, New Mills

Windowless Sample Borehole

P7434

GRM Project Ref:

Borehole No

WS103 Sheet 1 of 1

Ground Level

(mAOD) 182.25

Coordinates

Е

Ν

400663

385348

	Clien	t:	Forre	est			
Installation/ Backfill Water Strike			Sample	es/Tests		D	epth
		Depth	Туре	Result	(Blows per 100mm)	((m)
		0.20 - 0.30	D			0	.20

Ę II	ke fe		Sample	es/Tests		Depth	Level	I		
Installa Back	Wat Stril	Depth	Туре	Result	Dynamic Probing (Blows per 100mm)	(m)	(m)	Legend	Stratum Description	
									Grass over dark brown, clayey, SAND.	-
		0 20 -				0.20	182.05		TOPSOIL	
		0.30				0.20	102.00		Loose, dark brown, slightly gravelly,	
						0.40	181.85		fine to medium, sub-angular	
		0.50 -	D						Sandstone.	
		0.60	9	48 (10,15/48 for		0.60	181.65	• • • • • •	Loose, light brown, very sandy,	
		0.00	3	105mm)					GRAVEL with high cobble content. Sand is fine to coarse. Gravel is fine to	
									medium, sub-angular, quartzite and	
		0.90 - 1.00	D						Sandstone. WEATHERED WOODHEAD HILL	-
×////x×////x		1.00				1.00	181.25		ROCK	
									coarse, angular to sub-angular as	-
									gravel and cobbles.	
									WOODHEAD HILL ROCK	
									End of Borehole at 1.00m	
										-
										-
										2 –
										3 -
										-
										4 -
										-
Crew:	Dyna	amic Sa	mpling	Ltd.	Logger: SS	6		We	eather: Dry	
Eq	uipmo	ent:	Windo	w Sampling R	ig					
R	easoi	n for te	rminati	ion of borehol	e: Refusal on	Rock				
Groun	dwate	r Rema	arks:							
No gro	undwa	ater obs	served.							
Genera	al Ren	narks:								
Uale	Cto at		17/10	/2016 4	le Complete:			Vorei	on: FINAL Scalo: 405	
HOIE	Siarte	÷u.	17/10		ie complete.			46121	on. 1107L Scale. 1:25	



Windowless Sample ole

Borehole No

WS103A

Sheet 1 of 1 **Ground Level**

(mAOD) 182.22

Coordinates

Е

Ν

1

2

400657

385351

Stratum Description Grass over dark brown, clayey, SAND.

Loose, dark brown, slightly gravelly, SAND. Sand is fine to coarse. Gravel is fine to medium, sub-angular, quartzite

Loose, light brown, very sandy GRAVEL with high cobble content. Sand is medium to coarse. Gravel and Cobbles are fine to coarse, angular to sub-angular, sandstone, siltstone.

Strong SANDSTONE recovered as fine to coarse, angular to sub-angular as gravel and cobbles.

WEATHERED WOODHEAD HILL

WOODHEAD HILL ROCK End of Borehole at 1.00m

Sand is fine to coarse.

and sandstone. GLACIAL DEPOSITS

Decentrometer, en art			First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com					Borehole					
Si	te Na	me:	Quar	rry Road, New	/ Mills								
	Clien	t:	Forre	est				GRM Project Ref:				P7434	
ation/ kfill	ter ke		Sample	es/Tests	Dumanuia	Duching	De	epth	Level	Logond			
Install Bac	Stri	Depth	Туре	Result	(Blows per	r 100mm)	(m)	(m)	Legend			
		0.00 - 0.20 0.50 - 0.60 1.00 1.00	D	50 (10,14/50 for 95mm)			00011	.30 50 .70 .00	181.92 181.72 181.52 181.22		C S S S S S S S S S S S S S S S S S S S	irass ove iand is fin 'OPSOIL oose, dar iAND. Sa ne to med nd sands <u>iLACIAL</u> oose, ligf iRAVEL v iand is me Cobbles al ub-angulik VEATHEF <u>COCK</u> ivong SA o coarse, rravel and <u>VOODHE</u>	



P7434

and roots. MADE GROUND

gravel and cobble. MADE GROUND

sandstone and brick. MADE GROUND

Stratum Description

Vegetation over dark brown, sandy CLAY. Sand is fine to coarse. MADE GROUND

Firm (medium strength), dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular, bricks, siltstone

Firm (medium strength), brown mottled greyish brown, and yellowish brown,

slightly gravelly CLAY. Gravel is fine to

coarse, sub-angular, to sub-rounded,

Firm, (medium strength), sandy very gravelly CLAY with pockets of clayey sandy GRAVEL and low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular, siltstone, brick and sandstone. MADE GROUND

Moderately strong light yellow SANDSTONE boulder recovered as

Borehole No

WS104 Sheet 1 of 1

Ground Level (mAOD)

(**MAOD**) 181.02

Coordinates

Е

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2

3

400709

385383

	geservironmente	1.0		Tel (HQ): 01283 55124 Email: info@grm-uk.co	2007 49 pm		B	bren	0			
Si	te Na	me:	Qua	rry Road, New	/ Mills							
	Clien	it:	Forre	est			GRM Project Ref:					
	er (e		Sampl	es/Tests		Denth						
Back	Wat Stril	Depth	Туре	Result	Dynamic Probing (Blows per 100mm)	(m)	(m)	Legend				
		0.00 - 0.20 0.00 - 0.20	D ES			0.10	180.92					
,,		0.50 - 0.60	D			0.40 0.50	180.62 180.52					
		1.00 1.00 - 1.10	C D	N=5 (1,1/1,2,1,1)								
		1.60 - 1.70	D									
		2.00	С	N=6 (1,1/1,1,2,2)								
		2.50 - 2.60	D									
		2.90 - 3.00 3.00	D C	N=10 (1,2/3,2,2,3)		3.00	178.02					
		3.50 - 3.60	D									
		3.90 - 4.00 4.00	D C	50 (50 for 95mm/50 for 20mm)		4.00	177.02					
				1	•			1	-			

4 End of Borehole at 4.00m Crew: Dynamic Sampling Ltd Logger: SS Weather: Dry Equipment: Window Sampling Rig Reason for termination of borehole: Refusal on Rock Groundwater Remarks: Damp from 3.7m. **General Remarks:** 17/10/2016 Version: FINAL **Hole Started:** Hole Complete: Scale: 1:25



Borehole No

WS105 Sheet 1 of 2

Ground Level (mAOD)

180.54

P7434
Coordinates
400715 E
385367 N
Stratum Description
Vegetation over dark brown, slightly
gravelly CLAY. Sand is fine to coarse,
Gravel is fine to medium, angular to
sub-angular, brick, roots.
MADE GROUND
Firm, (Medium strength), brown
gravelly CLAY with high cobble content.

Si	Site Name:			rry Road, New	/ Mills						
	Clien	t:	Forre	est		G	P7434				
fill fill	er (e		Sample	es/Tests		Denth		l evel	Level		
Installa Back	Wat Strij	Depth	Туре	Result	Dynamic Probing (Blows per 100mm)	(m)	(m)	Legend		
		0.00 - 0.20 0.00 - 0.20 0.20 - 0.50	D ES D			0.	20	180.34		Vegetation gravelly Cl Gravel is fi sub-angula MADE GR Firm, (Meo gravelly Cl	
	•	0.60 - 0.70	D			0.	.60	179.94		Gravel is fi concrete, r MADE GR Loose, bla GRAVEL v is fine to co	
	0 4 9 9	1.00 1.00 - 1.10	C D	N=4 (1,1/1,1,1,1)		1.	.00	179.54		are fine to angular, br MADE GR Firm, medi and greeni CLAY, with GRAVEL a Sand is fin	

neral Rei	marks:										
groundw	ater obs	erved.									
Reaso	n for te	rminati arks:	ion of bore	hole:	Target D	epth reach	ned				
⊏quipm	ent:	vvindo	w Sampling								
w: Dyna	amic Sa	mpling			bgger: S	55		wea	tner: Dry		
								\A/		lext Sheet	
**************************************	4.00	С	N=14 (3,4/3,4,4,5	3)							4
· · · · · · · · · · · · · · · · · · ·	3.00 3.10 - 3.20	C D	N=10 (4,4/3,2,2,3	3)							3
* * * * * * * * * * * * * * * * *	2.80 - 3.00	D									
* * • • • • • • • • • • • • • • • • • •	2.40 - 2.60	D							greyish black, clayey s GRAVEL with low cob is fine to coarse. Grav coarse, angular to sub ash and metal. MADE GROUND	SAND and ble content. Sa el is fine to p-rounded, brick	nd ^ĸ ,
°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°	2.00	С	N=5 (2,1/1,2,	,1,1)		2.00	178.54		Loose to medium den	se, brown mottl	2
**************************************	1.50 - 1.60	D							and greenish brown, s CLAY, with pockets of GRAVEL and medium Sand is fine to coarse coarse, angular to sub sandstone, bone, met	r, greysh black sandy gravelly very sandy cobble content . Gravel is fine p-angular, brick, al and ash.	t. to
	1.00 1.00 - 1.10	C D	N=4 (1,1/1,1,	,1,1)		1.00	179.54		Loose, black and dark GRAVEL with low cob is fine to coarse. Grav are fine to coarse, and angular, brick, and sau MADE GROUND Eirm modum strongth	brown, SAND ble content. Sa el and Cobbles gular to sub- ndstone.	&
	0.60 - 0.70	D				0.60	179.94		concrete, metal. MADE GROUND		



Borehole	No

WS105 Sheet 2 of 2

Ground Level (mAOD)

Site Name: Quarry Road, New Mills

				,					180.54	4	
	Clien	t:	Forre	⊧st		G	RM Pro	oject Ref	: P7434	Coordina 400715 385367	ates E N
llation/ ckfill	ater rike		Sample	⊧s/Tests	Dynamic Probing	Depth	Level	Legend	Stratum Description		
Ba	Sti	Depth	Туре	Result	(Blows per 100mm)	(m)	(m)	Logona			
		4.50 - 4.60 4.60 - 4.80	D D			4.60	175.94		Stiff, greyish brown mottled ligh sightly gravelly CLAY. Gravel is medium, sub-rounded, siltstone sandstone.	it brown, fine to and	
		5.00	с	N=19		5.00	175.54		MADE GROUND		5 —
				(4,4/5,5,4,5)					End of Borehole at 5.00m		6 7 7 8 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Crew:	Dyna	amic Sa	mpling	Ltd.	Logger: SS			Wea	ather: Dry		
Eq	uipm	ent:	Windo	w Sampling Ri	ig			1			
R Ground No grou	easoi dwate undwa	n for te er Rema ater obs	rminati arks: erved.	on of borehol	e: Target Dep	th reach	ed				
Genera	al Rer	narks:									
Hole	Starte	ed:	17/10/	/2016 Ho	le Complete:		Versio	n: FINAL Sca	l le: 1:25		



Borehole No

WS106 Sheet 1 of 1

Ground Level

(mAOD)

180.55 Coordinates **Client: GRM Project Ref:** P7434 Forrest 400687 Е 385291 Ν nstallation/ Backfill Samples/Tests Water Strike Depth Level Dynamic Probing Legend Stratum Description (m) (m) Depth Туре Result (Blows per 100mm) Vegetation over soft, dark brown, 0.10 -D slightly sandy, slightly gravelly CLAY. 0.30 0.20 180.35 Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, brick and metal MADE GROUND Stiff (high strength) dark brown, slightly sandy, very gravelly, CLAY with pockets of clayey GRAVEL and 0.80 -D COBBLES of fine to coarse, angular brith brith brith brith brith 1.00 flagstone. Sand is fine to coarse. 1.00 С N=10 Gravel is fine to coarse, sub-angular, 1 sandstone, brick (2,3/2,3,3,2) MADE GROUND 1.50 -D 1.70 1.90 -D 2.00 N=16 2 2.00 С (3,4/4,3,4,5) 2.50 -D 2.60 2.90 -D 3.00 50 (7,15/50 for 3.00 177.55 3 End of Borehole at 3.00m 3.00 С . 180mm) 4 Dry Crew: Dynamic Sampling Ltd. Logger: SS Weather: Window Sampling Rig Equipment: Reason for termination of borehole: Refusal on Rock Groundwater Remarks: Wet from 3.6m **General Remarks:** Slight collapse from 2.5m. 17/10/2016 Version: FINAL Hole Complete: Scale: **Hole Started:** 1:30

Site Name: Quarry Road, New Mills



Windowless Sample Borehole

Borehole No

WS107 Sheet 1 of 2

Ground Level (mAOD)

Si	te Na	me:	Qua	rry Road, Nev	v Mills					(mAOD)	
	Clien		Forre	act		G	RM Pro	niect Ref	P7/13/	Coordinates	;
			TON	531					17404	400706 E 385349 N	
istallation/ Backfill	Water Strike	Depth	Sample Type	es/Tests Result	Dynamic Probing	Depth (m)	Level (m)	Legend	Stratum Description		
<u> </u>		0.00 - 0.20 0.20 - 0.40	D			0.20	180.47		Vegetation over soft brown, sa gravelly CLAY. Sand is fine to c Gravel is fine to coarse, angula rounded, sandstone, brick, mu and roots. MADE GROUND Firm, brown mottled greyish bl. slightly gravelly, CLAY. Gravel coarse, angular to sub-angular	ndy coarse. ar to sub- dstone ack, is fine to	-
		0.90 1.00	D C	N=5 (1,1/1,1,1,2)		0.80	179.87		sandstone and ash. MADE GROUND Loose to medium dense, dark clayey SAND & GRAVEL with of slightly gravelly CLAY. Sand coarse. Gravel is fine to coarse angular, mudstone, sandstone ash. Gravel in CLAY is fine to r MADE GROUND	grey pockets is fine to a, sub- , brick, nedium.	
		1.50 - 1.70	D			1.40	179.27		Loose, brown clayey, very grav SAND with pockets of slightly g sandy CLAY with low cobble co Sand is fine to coarse. Gravel coarse, angular to sub-angular sandstone.	relly gravelly, ontent. is fine to	
		2.00 2.00 - 2.30	C D	N=6 (2,1/2,1,1,2)					MADE GROUND	2	
		3.00	С	N=10 (2,3/3,2,3,2)						3	-
		3.50 - 3.70	D								
		3.90 - 4.00 4.00	D C	N=9 (4,1/1,2,3,3)					Continued on Next Sheet	4	-
Crew:	Dyna	amic Sa	mpling	Ltd.	Logger: SS	;		Wea	ther:	I	
Eq	luipm	ent:	Windo	ow sampling rig	J.						
R	leaso	n for te	rminati	ion of borehol	e: Target dep	th reach	ed.				
Groun	dwate	er Rema	arks:								
Genera	al Rer	narks:	erveu.								
- 51101											
Hole	Starte	ed:	17/10	/2016 H c	le Complete:			Versior	n: FINAL Sca	ale: 1:25	_



Borehole	No

WS107 Sheet 2 of 2

Ground Level (mAOD)

Si	te Na	me:	Quar	ry Road, Ne	ew Mills						(mAOD)
	Clien	it:	Forre	est		G	SRM Pro	oject Re	f : P7434	C c 4	ordinates
/u			Sampla							3	85349 N
Installatio Backfill	Water Strike	Depth	Туре	Result	Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Descriptio	on	
	We Str	Depth 4.50 - 4.80 5.00	C	Result N=14 (4,4/3,3,4,4)	(Blows per 100mm)	(m) 4.60 5.30	(m) 176.07 175.37		Medium dense, greyish brov very sandy, GRAVEL with lo content. Sand is fine to coar is fine to coarse, sub-angula sandstone. MADE GROUND End of Borehole at 5.30	vn, claye w cobble se. Grav r,	ey, eel 5
											7
											8
Crew:	Dyna	amic Sa	ampling	Ltd.	Logger: SS	6		We	eather:		
Eq	uipm	ent:	Windo	w sampling i	ig.						
R	easo	n for te	rminati	on of boreh	ole: Target dep	th reach	ed.				
Groun No gro	dwate undwa	e r Rem ater obs	arks: served.								
Genera	al Rer	narks:									
			4-7-5	/00.4 <i>C</i>			,				
Hole	Starte	ed:	17/10/	/2016	lole Complete:			Versi	on: FINAL S	cale:	1:25



Borehole No

WS108 Sheet 1 of 2

Ground Level (mAOD)

(**MAOD**) 180.60

Site Name: Quarry Road, New Mills

Client:			Forre	est		G	RM Pro	ject Ref:	P7434	Coordin	ates F
/					<u>г</u>			-		385349	N
Installation Backfill	Water Strike	Depth	Sample Type	es/Tests Result	Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description		
		0.00 - 0.15	D			0.15	180.45		Vegetation over dark brown, se gravelly CLAY. Sand is fine to o Gravel is fine to medium, sub-a brick and roots. MADE GROLIND	andy, coarse. angular	
		0.40 - 0.50	D			0.50	180.10		Strong SANDSTONE boulder recovered as gravel and cobble	es.	
		0.60 - 0.80	D			0.60	180.00		Firm, greyish black, slightly gra very sandy, CLAY. Sand is fine coarse. Gravel is fine to coarse angular sandstone, concrete, a MADE GROUND	ivelly, to e, sub- ish.	
		1.00 1.10 - 1.40	C D	N=6 (1,1/2,1,1,2)					Firm, light grey, slightly sandy, sandy, CLAY. Sand is fine to ve coarse. Gravel is fine to coarse sandstone, ash and brick. MADE GROUND	very ry 2,	
		2.00 2.00 - 2.40	C D	N=6 (1,1/1,1,2,2)		2.00	178.60		Loose, black and dark brown, or sandy GRAVEL. Sand is fine to Gravel is fine to coarse, sub-ar rounded sandstone. MADE GROUND Sandstone boulder recovered as and cobbles.	clayey, o coarse. ngular to gular	2
		2.70 - 3.00	D			2.50	178.10		Stiff (high strength), greyish bro mottled brown, sandy, gravelly Gravel is fine to coarse, brick a MADE GROUND	own CLAY. Ind ash.	
		3.00 3.70 - 4.00	C	N=10 (2,2/2,3,2,3)		3.60	177.00		Medium dense, sandy, very cla GRAVEL with pockets of sandy	iyey gravelly Zavel is	3
		4.00	С	N=15 (3,3/4,4,4,3)					fine to coarse, angular to sub-a sandstone. MADE GROUND	angular,	4 —
••				1 4 4	L				Continued on Next Sheet		
Crew:	Dyna	unic Sa		L(Q.	Logger: SS			weat	iner: vvet		
		for to	rminati		y. Bofusal on	Pock					
Groun	dwate	r Rema	arks:			INUCK					
No gro	undwa	ater obs	erved.								
Gener	al Ren	narks:									
Hole	Starte	ed:	17/10	/2016 Ho	le Complete:			Version	: FINAL Sca	ale: 1:25	
		-			•					0	

G	RM		GRM	Development Solut	tions Ltd		Wir	ndow	less	Sample	e	Borehole	No
	Development gecenvironmental	. civil - BIRCIN		First Avenue, Centrum Burton-on-Trent, DE14 2 Tel (HO): 01283 5512	100, 2WH 49			Bo	breh	ole .		VVS10	8
Si	te Na	me:	Quar	ry Road, New	/ Mills							Sheet 2 of Ground L (mAOI 180.60	of 2 .evel D)
	Clien	t:	Forrest				C	RM Pro		Coordina 400686	ates E		
/u0	5		Sample	es/Tests								385349	N
Installatic Backfill	Wate Strike	Depth	Туре	Result	Dynami (Blows p	ic Probing er 100mm)	Depth (m)	Level (m)	Legend	Stra	atum Description		
		4.50 - 5.00	D C	50 (25 for 10mm/50 for 235mm)			5.00	175.60		End	of Borehole at 5.00m		6

					8							
Crew: Dynamic	Sampling Ltd.	Logger: SS		Weather: Wet								
Equipment:	Window Sampl	ing Rig.										
Reason for	Reason for termination of borehole: Refusal on Rock											
Groundwater Re	emarks:											
No groundwater	observed.											
General Remark	s:											
Hole Started:	17/10/2016	Hole Complete:	١	/ersion: FINAL	Scale: 1:25							

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Project Name:	Marsh Lane, New mills
Project Number:	P7434
Client:	HT Forest Ltd
Date:	25 October 2016
Weather:	Dry
Atmospheric Pressure (mb):	1002
Pressure Trend:	Rising
Equipment:	Gas Data GFM430
Operator:	Tom Robson

Ground Gases													Groundwater			
Well ID	Respor	nse Zone	(mbegl)	mbegl) Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm			Depth to Groundwater	Total Well Depth (mbegl)
	Тор	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady		(mbegi)	
RB101	6.2	8.2	NS	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R] [N/D	N/D
RB104	7.0	9.0	NS	0.00	0.00	0.00	0.00	21.20	21.20	0.0	0.0	N/R	N/R		6.17	8.83
RB106	5.6	8.1	NS	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R		N/D	N/D
WS101	1.0	5.0	NS	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R		N/D	N/D
WS104	0.7	4.0	MG	0.00	0.00	0.40	0.40	20.50	20.50	0.0	0.0	N/R	N/R		N/D	3.78
WS105	0.6	5.0	MG	0.00	0.00	0.10	0.10	20.70	20.70	0.0	0.0	N/R	N/R		N/D	4.70
WS106	0.5	2.5	MG	0.00	0.00	0.00	0.00	21.00	21.00	0.0	0.0	N/R	N/R		N/D	2.44
WS107	1.0	5.3	MG	0.00	0.00	0.00	0.00	20.80	20.80	0.0	0.0	N/R	N/R		5.20	5.30
WS108	1.0	5.0	MG	0.00	0.00	0.60	0.60	20.00	20.00	0.0	0.0	N/R	N/R		N/D	4.64

Comments: WS101 coud not find, WS106 and WS108 was not installed on this monitoring round

L.E.L.	Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas)	Highlighte	ed cell for following conditions:
N.D.	Not Detected		a. Methane ≥1% v/v
N.R.	Not Recorded		b. Carbon Dioxide ≥5% v/v
PID	Photo-Ionising Detector	MG	Made Ground
%	By volume	NS	Natural Strata



Project Name:	Marsh Lane, New mills
Project Number:	P7434
Client:	HT Forest Ltd
Date:	03 November 2016
Weather:	Wet
Atmospheric Pressure (mb):	997
Pressure Trend:	Rising
Equipment:	Gas Data GFM430
Operator:	Tom Robson

Ground Gases												Groundwater			
Well ID	Respor	nse Zone	(mbegl)) Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm)		Depth to Groundwater	Total Well Depth (mbegl)
	Тор	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady	(mbegi)	
RB101	6.2	8.2	NS	0.00	0.00	0.00	0.00	20.30	20.30	0.0	0.0	N/R	N/R	6.98	8.14
RB104	7.0	9.0	NS	0.00	0.00	0.00	0.00	20.30	20.30	0.0	0.0	N/R	N/R	7.50	8.70
RB106	5.6	8.1	NS	0.00	0.00	0.30	0.30	19.20	19.20	0.0	0.0	N/R	N/R	7.85	8.10
WS101	1.0	5.0	NS	0.00	0.00	1.60	1.60	17.50	17.50	0.0	0.0	N/R	N/R	N/D	5.03
WS104	0.7	4.0	MG	0.00	0.00	0.50	0.50	19.80	19.80	0.0	0.0	N/R	N/R	N/D	3.79
WS105	0.6	5.0	MG	0.00	0.00	0.10	0.10	20.10	20.10	0.0	0.0	N/R	N/R	N/D	5.18
WS106	0.5	2.5	MG	0.00	0.00	0.00	0.00	20.20	20.20	0.0	0.0	N/R	N/R	N/D	2.45
WS107	1.0	5.3	MG	0.00	0.00	0.40	0.40	19.70	19.70	0.0	0.0	N/R	N/R	N/D	5.29
WS108	1.0	5.0	MG	0.00	0.00	0.90	0.90	19.50	19.50	0.0	0.0	N/R	N/R	N/D	4.66

Comments:

L.E.L.	Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas)	Highlighte	d cell for following conditions:
N.D.	Not Detected		a. Methane ≥1% v/v
N.R.	Not Recorded		b. Carbon Dioxide ≥5% v/v
PID	Photo-Ionising Detector	MG	Made Ground
%	Bv volume	NS	Natural Strata



Project Name:	Marsh Lane, New mills
Project Number:	P7434
Client:	HT Forest Ltd
Date:	21 November 2016
Weather:	Wet
Atmospheric Pressure (mb):	987
Pressure Trend:	Falling
Equipment:	Gas Data GFM430
Operator:	George Salloway

Ground Gases											Groundwater				
Well ID	ID Response Zone (mbegl)		(mbegl)	Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm)		Depth to Groundwater	Total Well Depth (mbegl)
	Тор	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady	(mbegi)	
RB101	6.2	8.2	NS	0.00	0.00	0.50	0.50	19.60	19.60	0.0	0.0	N/R	N/R	5.30	8.00
RB104	7.0	9.0	NS	0.00	0.00	0.20	0.20	20.10	20.20	0.0	0.0	N/R	N/R	5.85	8.60
RB106	5.6	8.1	NS	0.00	0.00	0.70	0.70	19.00	19.00	0.0	0.0	N/R	N/R	4.65	8.10
WS101	1.0	5.0	NS	0.00	0.00	0.70	0.60	18.70	18.80	1.1	0.0	N/R	N/R	4.03	4.90
WS104	0.7	4.0	MG	0.00	0.00	2.70	2.70	16.40	16.40	0.1	0.1	N/R	N/R	N/D	3.85
WS105	0.6	5.0	MG	0.00	0.00	0.80	0.80	18.00	18.00	0.0	0.0	N/R	N/R	N/D	5.00
WS106	0.5	2.5	MG	0.00	0.00	0.10	0.10	20.70	20.70	0.0	0.0	N/R	N/R	N/D	2.40
WS107	1.0	5.3	MG	0.00	0.00	0.30	0.30	19.90	20.70	0.0	0.0	N/R	N/R	5.00	5.10
WS108	1.0	5.0	MG	0.00	0.00	0.70	0.70	19.00	19.00	0.0	0.0	N/R	N/R	N/D	4.60

Comments:

				_
L.E.L.	Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas)	Highlighte	ed cell for following conditions:	
N.D.	Not Detected		a. Methane ≥1% v/v	
N.R.	Not Recorded		b. Carbon Dioxide ≥5% v/v	
PID	Photo-Ionising Detector	MG	Made Ground	
%	By volume	NS	Natural Strata	



Project Name:	Marsh Lane, New mills
Project Number:	P7434
Client:	HT Forest Ltd
Date:	05 December 2016
Weather:	Wet
Atmospheric Pressure (mb):	1002
Pressure Trend:	Rising
Equipment:	Gas Data GFM430
Operator:	Tom Robson

Ground Gases											Groundwater				
Well ID	ell ID Response Zone (mbegl)		(mbegl)	Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm)		Depth to Groundwater	Total Well Depth (mbegl)
	Тор	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady	(mbegi)	
RB101	6.2	8.2	NS	0.00	0.00	0.00	0.00	20.10	20.10	0.0	0.0	N/R	N/R	5.50	8.14
RB104	7.0	9.0	NS	0.00	0.00	0.00	0.00	19.10	19.10	0.0	0.0	N/R	N/R	5.88	8.20
RB106	5.6	8.1	NS	0.00	0.00	0.00	0.00	20.10	20.10	0.0	0.0	N/R	N/R	6.00	8.83
WS101	1.0	5.0	NS	0.00	0.00	1.30	1.30	17.50	17.50	0.0	0.0	N/R	N/R	4.63	5.02
WS104	0.7	4.0	MG	0.00	0.00	2.10	2.10	16.00	16.00	0.0	0.0	N/R	N/R	N/D	3.78
WS105	0.6	5.0	MG	0.00	0.00	1.20	1.20	18.40	18.40	0.0	0.0	N/R	N/R	N/D	5.17
WS106	0.5	2.5	MG												
WS107	1.0	5.3	MG	0.00	0.00	0.50	0.50	19.80	19.80	0.0	0.0	N/R	N/R	5.10	5.25
WS108	1.0	5.0	MG	0.00	0.00	0.50	0.50	19.80	19.80	0.0	0.0	N/R	N/R	N/D	4.66

Comments: WS106 WAS DESTROYED

L.E.L.	Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas)	Highlighted ce	I for following conditions:
N.D.	Not Detected	a.	Methane ≥1% v/v
N.R.	Not Recorded	b.	Carbon Dioxide ≥5% v/v
PID	Photo-Ionising Detector	MG	Made Ground
%	By volume	NS	Natural Strata



Project Name:	Marsh Lane, New mills
Project Number:	P7434
Client:	HT Forest Ltd
Date:	21 December 2016
Weather:	Wet
Atmospheric Pressure (mb):	994
Pressure Trend:	Falling
Equipment:	Gas Data GFM430
Operator:	Tom Robson

Ground Gases												Groundwater				
Well ID	ell ID Response Zone (mbegl)		(mbegl)	Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm)			Depth to Groundwater	Total Well Depth (mbegl)
	Тор	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady		(mbegi)	
RB101	6.2	8.2	NS	0.00	0.00	0.00	0.00	20.10	20.10	0.0	0.0	N/R	N/R) [5.50	8.15
RB104	7.0	9.0	NS	0.00	0.00	0.90	0.90	19,1	19.10	0.0	0.0	N/R	N/R	[6.15	8.23
RB106	5.6	8.1	NS	0.00	0.00	0.00	0.00	20.20	20.20	0.0	0.0	N/R	N/R	1 [6.10	8.83
WS101	1.0	5.0	NS	0.00	0.00	0.00	0.00	20.20	20.20	0.0	0.0	N/R	N/R	[N/D	
WS104	0.7	4.0	MG	0.00	0.00	2.20	2.20	17.00	17.00	0.0	0.0	N/R	N/R	1 [N/D	3.80
WS105	0.6	5.0	MG	0.00	0.00	1.50	1.50	17.90	17.90	0.0	0.0	N/R	N/R	[N/D	5.13
WS106	0.5	2.5	MG													
WS107	1.0	5.3	MG	0.00	0.00	1.00	1.00	19.10	19.10	0.0	0.0	N/R	N/R		5.11	5.21
WS108	1.0	5.0	MG	0.00	0.00	1.20	1.20	19.20	19.20	0.0	0.0	N/R	N/R	[N/D	4.70
] [
														[

Comments: WS106 DESTROYED

L.E.L.	Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas)	Highlighted cel	for following conditions:
N.D.	Not Detected	a.	Methane ≥1% v/v
N.R.	Not Recorded	b.	Carbon Dioxide ≥5% v/v
PID	Photo-Ionising Detector	MG	Made Ground
%	By volume	NS	Natural Strata



Project Name:	Marsh Lane, New mills
Project Number:	P7434
Client:	HT Forest Ltd
Date:	06 January 2017
Weather:	Wet
Atmospheric Pressure (mb):	1032
Pressure Trend:	Falling
Equipment:	Gas Data LMSXi
Operator:	Liam Press

Ground Gases												Groundwater				
Well ID	Vell ID Response Zone (mbegl)		(mbegl)	Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm			Depth to Groundwater	Total Well Depth (mbegl)
	Тор	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady		(mbegi)	
RB101	6.2	8.2	NS	0.00	0.00	0.00	0.00	21.00	21.00	0.0	0.0	N/R	N/R] [5.50	8.15
RB104	7.0	9.0	NS	0.00	0.00	0.00	0.00	21.00	21.00	0.0	0.0	N/R	N/R		6.10	8.83
RB106	5.6	8.1	NS	0.00	0.00	0.40	0.40	20.70	20.70	0.0	0.0	N/R	N/R		6.02	8.10
WS101	1.0	5.0	NS	0.00	0.00	2.00	2.00	17.40	17.40	0.0	0.0	N/R	N/R		4.55	5.03
WS104	0.7	4.0	MG	0.00	0.00	1.40	1.40	19.60	19.60	0.0	0.0	N/R	N/R	1 [N/D	3.83
WS105	0.6	5.0	MG	0.00	0.00	0.10	0.10	20.80	20.80	0.0	0.0	N/R	N/R		N/D	5.20
WS106	0.5	2.5	MG													
WS107	1.0	5.3	MG	0.00	0.00	0.10	0.10	20.90	20.90	0.0	0.0	N/R	N/R		5.13	5.23
WS108	1.0	5.0	MG	0.00	0.00	0.90	0.90	20.30	20.30	0.0	0.0	N/R	N/R		N/D	4.65
] [

Comments: WS106 DESTROYED

L.E.L.	Lower Explosive Limit (100% L.E.L.'= 5% Flammable Gas)	Highlighted ce	I for following conditions:
N.D.	Not Detected	a.	Methane ≥1% v/v
N.R.	Not Recorded	b.	Carbon Dioxide ≥5% v/v
PID	Photo-Ionising Detector	MG	Made Ground
%	By volume	NS	Natural Strata



	135	Plot 15	Piot 17 18:891	
NOTES:				
ে IFNT HT Forrest Ltd	ΤΠ.Ε.	PROJECT No: P7434	DATE: 11/2016	GRM
PROJECT:	Ground Gas Protection Measures Plan	DESIGN/DRAWN:	ISSUE: FINAL	GRM Development Solutions Ltd
Land off Marsh Lane, New Mills		© GRM Devel © Crown Copy	opment Solutions Ltd yright. AL 100014100	Burton-on-Trent, Staffordshire Tel: 01283 551 249 Fax: 01283 211 968 mail@grm-uk.com www.grm-uk.com